

MINOR SOURCE OPERATING PERMIT

OFFICE OF AIR QUALITY

**Plymouth Tube Company
504 North Keller Avenue
Winamac, Indiana 46996**

(herein known as the Permittee) is hereby authorized to operate subject to the conditions contained herein, the emission units described in Section A (Source Summary) of this permit.

This permit is issued to the above mentioned company under the provisions of 326 IAC 2-1.1, 326 IAC 2-6.1 and 40 CFR 52.780, with conditions listed on the attached pages.

Operation Permit No.: MSOP 131-7690-00014	
Issued by: Original Signed by Paul Dubenetzky Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date: July 31, 2001 Expiration Date: July 31, 2006

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SECTION A

SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the source contained in Conditions A.1 and A.2 are descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information [326 IAC 2-5.1-3(c)] [326 IAC 2-6.1-4(a)]

The Permittee owns and operates a stationary seamless steel pipe and tube production source.

Authorized Individual: Clayton R. Conway
Source Address: 504 North Keller Avenue, Winamac, Indiana 46996
Mailing Address: P.O. Box 278, Winamac, IN 46996
Phone Number: 219-946-6657
SIC Code: 3317
County Location: Pulaski
County Status: Attainment for all criteria pollutants
Source Status: Minor Source Operating Permit
Minor Source, under PSD Rules;
Minor Source, Section 112 of the Clean Air Act

A.2 Emissions Units and Pollution Control Equipment Summary

This stationary source is approved to operate the following emissions units and pollution control devices:

(a) One (1) Cold Draw, known as EU01A, consisting of the following equipment:

- (1) One (1) natural gas-fired annealing furnace, known as EU01A-#10, installed in September 1988, exhausted to stacks F, G, and H, rated at 8.28 million British thermal units per hour, capacity: 5.0 tons per hour of steel.
- (2) One (1) natural gas-fired annealing furnace, known as EU01A-#11, installed in September 1988, exhausted to stacks C, D, and E, rated at 9.54 million British thermal units per hour, capacity: 7.5 tons per hour of steel.
- (3) Two (2) natural gas-fired boilers, known as EU01A-Boiler 1 and EU01A-Boiler 2, constructed in 1988, exhausting to stacks EU01A-T and EU01A-U, respectively, rated at 7.0 million British thermal units per hour and 5.0 million British thermal units per hour, respectively.
- (4) Two (2) natural gas-fired tank heaters, known as EU01A-Z and EU01A-AA, constructed in February 1988, exhausting to the general facility, rated at 2.5 million British thermal units per hour, total.
- (5) One (1) natural gas-fired annealing furnace, known as EU01A-#1, installed in 1961, exhausted to stacks P and AB, rated at 4.80 million British thermal units per hour, capacity: 13.0 tons per hour of steel.
- (6) One (1) Micro-HN process boiler, known as EU01A-HN, installed in 2000, exhausted into the oxygen free tube curing process, rated at 11.6 million British

thermal units per hour.

- (7) Six (6) flame curtains, installed in 2000, rated at 0.264 million British thermal units per hour.
- (b) One (1) Weld Mill, known as EU01B, consisting of the following equipment:
 - (1) One (1) natural gas-fired annealing furnace, known as EU01B-West, constructed in 1972, exhausting to stacks A, B, C, D, and E, rated at 17.1 million British thermal units per hour, capacity: 7.5 tons per hour of steel.
 - (2) Four (4) natural gas-fired unit heaters, known as EU01B-T1 through T4, installed in 1994, exhausted through stacks ST1 through ST4, respectively, rated at 1.60 million British thermal units per hour, total.
 - (3) One (1) natural gas-fired unit heater, known as EU01B-V, installed in 1972, exhausted through stack V, rated at 1.875 million British thermal units per hour.
 - (4) One (1) natural gas-fired annealing furnace, known as EU01B-East, constructed in 1988, exhausting to stacks K, R, and J, rated at 5.70 million British thermal units per hour, capacity: 7.5 tons per hour of steel.
 - (5) Four (4) flame curtains, installed in 2000, rated at 0.176 million British thermal units per hour.
- (c) One (1) Hot Mill, known as EU01C, consisting of the following equipment:
 - (1) One (1) natural gas-fired billet heating furnace, known as EU01C-Billet Furnace, constructed in June 1988, exhausting to stack L and roof exhaust fan C9, rated at 30.0 million British thermal units per hour (modified from 26.0 million British thermal units per hour), capacity: 14.0 tons per hour of steel.
 - (2) One (1) natural gas-fired annealing furnace, known as EU01C-Annealing Furnace, constructed in June 1991, exhausting to stacks F, G, H, and roof exhaust fan C8, rated at 44.8 million British thermal units per hour, capacity: 9.0 tons per hour of steel.
 - (3) Two (2) natural gas-fired boilers, known as EU01C-Boiler 1 and EU01C-Boiler 2, constructed in August 1990, exhausting to stacks EU01C-M1 and EU01C-M2, respectively, rated at 7.0 million British thermal units per hour, each.
 - (4) Twenty-three (23) natural gas-fired unit heaters, known as EU01C-P1 through P12, EU01C-R1 through R6, EU01C-S1 and S2, EU01C-T1 and T2, and EU01C-U installed in 1994, rated at 6.95 million British thermal units per hour, total.
- (f) One (1) natural gas-fired emergency generator, exhausted through stack GEN-1, rated at 0.649 million British thermal units per hour.
- (g) Two (2) metal inert gas (MIG) welding stations (for maintenance only).
- (h) Six (6) stick welding stations (for maintenance only).
- (i) Oxyacetylene flame-cutting (for maintenance only).

- (j) One (1) gasoline storage tank, capacity: 250 gallons, throughput: 858 gallons per year.
- (k) Two (2) diesel oil storage tanks, capacity: 250 gallons, each, throughput: 3,632 gallons per year, total.
- (l) One (1) kerosene storage tank, capacity: 250 gallon, throughput: 450 gallons per year.
- (m) Machining where an aqueous cutting coolant continuously floods the machining interface, using Emulsiplex Soluble Oil at 0.3 pounds per hour, capacity 38,250 pounds of steel per hour.
- (n) One (1) quarter mile unpaved stone road, supporting a maximum gross vehicle weight of thirty-five (35) tons of 18 wheel flatbed semi trailers, one (1) fork lift, and three (3) side loaders, a maximum of three (3) round trips per day, and a speed limit of five (5) miles per hour.

GENERAL CONDITIONS

B.1 Permit No Defense [IC 13]

B.2 Definitions

B.3 Effective Date of the Permit [IC13-15-5-3]

B.4 Modification to Permit [326 IAC 2]

B.5 Minor Source Operating Permit [326 IAC 2-6.1]

- B.6 Permit Term [326 IAC 2-6.1-7]

This permit is issued for a fixed term of five (5) years from the original date, as determined in accordance with IC 4-21.5-3-5(f) and IC 13-15-5-3. Subsequent revisions, modifications or amendments of this permit do not affect the expiration date.

SECTION C SOURCE OPERATION CONDITIONS

Entire Source

C.1 PSD Minor Source Status [326 IAC 2-2] [40 CFR 52.21]

- (a) The total source potential to emit of CO and NO_x is less than two hundred fifty (250) tons per year. Therefore the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration) and 40 CFR 52.21 will not apply.
- (b) Any change or modification which may increase potential to emit PM₁₀, SO₂, VOC, NO_x or CO to 100 tons per year from this source, shall cause this source to be considered a major source under 326 IAC 2-7, and shall require approval from IDEM, OAQ prior to making the change.
- (c) Any change or modification which may increase potential to emit to two hundred fifty (250) tons per year from this source, shall cause this source to be considered a major source under PSD, 326 IAC 2-2 and 40 CFR 52.21, and shall require approval from IDEM, OAQ prior to making the change.

C.2 Hazardous Air Pollutants (HAPs) [326 IAC 2-7]

Any change or modification which may increase potential to emit to ten (10) tons per year of any single hazardous air pollutant, twenty-five (25) tons per year of any combination of hazardous air pollutants from this source, shall cause this source to be considered a major source under Part 70 Permit Program, 326 IAC 2-7, and shall require approval from IDEM, OAQ prior to making the change.

C.3 Preventive Maintenance Plan [326 IAC 1-6-3]

- (a) If required by specific condition(s) in Section D of this permit, the Permittee shall prepare and maintain Preventive Maintenance Plans (PMP) after issuance of this permit, including the following information on each emissions unit:
 - (1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;
 - (2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions;
 - (3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.
- (b) The Permittee shall implement the Preventive Maintenance Plans as necessary to ensure that failure to implement the Preventive Maintenance Plan does not cause or contribute to a violation of any limitation on emissions or potential to emit.
- (c) PMP's shall be submitted to IDEM, OAQ, upon request and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ, may require the Permittee to revise its Preventive Maintenance Plan whenever lack of proper maintenance causes or contributes to any violation.

C.4 Permit Revision [326 IAC 2-5.1-3(e)(3)] [326 IAC 2-6.1-6]

- (a) The Permittee must comply with the requirements of 326 IAC 2-6.1-6 whenever the Permittee seeks to amend or modify this permit.

- (b) Any application requesting an amendment or modification of this permit shall be submitted to:

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

Any such application should be certified by the "authorized individual" as defined by 326 IAC 2-1.1-1.

- (c) The Permittee shall notify the OAQ within thirty (30) calendar days of implementing a notice-only change. [326 IAC 2-6.1-6(d)]

C.5 Inspection and Entry [326 IAC 2-5.1-3(e)(4)(B)] [326 IAC 2-6.1-5(a)(4)]

Upon presentation of proper identification cards, credentials, and other documents as may be required by law, and subject to the Permittee's right under all applicable laws and regulations to assert that the information collected by the agency is confidential and entitled to be treated as such, the Permittee shall allow IDEM, OAQ, U.S. EPA, or an authorized representative to perform the following:

- (a) Enter upon the Permittee's premises where a source is located, or emissions related activity is conducted, or where records must be kept under the conditions of this permit;
- (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- (c) Inspect, at reasonable times, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit;
- (d) Sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with this permit or applicable requirements; and
- (e) Utilize any photographic, recording, testing, monitoring, or other equipment for the purpose of assuring compliance with this permit or applicable requirements.

C.6 Transfer of Ownership or Operation [326 IAC 2-6.1-6(d)(3)]

Pursuant to 326 IAC 2-6.1-6(d)(3):

- (a) In the event that ownership of this source is changed, the Permittee shall notify IDEM, OAQ, Permits Branch, within thirty (30) days of the change.
- (b) The written notification shall be sufficient to transfer the permit to the new owner by a notice-only change pursuant to 326 IAC 2-6.1-6(d)(3).
- (c) IDEM, OAQ, shall issue a revised permit.

The notification which shall be submitted by the Permittee does require the certification by the "authorized individual" as defined by 326 IAC 2-1.1-1.

C.7 Permit Revocation [326 IAC 2-1-9]

Pursuant to 326 IAC 2-1-9(a)(Revocation of Permits), this permit to operate may be revoked for any of the following causes:

- (a) Violation of any conditions of this permit.
- (b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this permit.
- (c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this permit shall not require revocation of this permit.
- (d) Noncompliance with orders issued pursuant to 326 IAC 1-5 (Episode Alert Levels) to reduce emissions during an air pollution episode.
- (e) For any cause which establishes in the judgment of IDEM, the fact that continuance of this permit is not consistent with purposes of this article.

C.8 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary alternative opacity limitations), opacity shall meet the following, unless otherwise stated in this permit:

- (a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor in a six (6) hour period.

C.9 Fugitive Dust Emissions [326 IAC 6-4]

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions). 326 IAC 6-4-2(4) is not federally enforceable.

Testing Requirements

C.10 Performance Testing [326 IAC 3-6] [326 IAC 2-1.1-11]

- (a) Compliance testing on new emissions units shall be conducted within sixty (60) days after achieving maximum production rate, but no later than one hundred eighty (180) days after initial start-up, if specified in Section D of this approval. All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this permit, utilizing any applicable procedures and analysis methods specified in 40 CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by IDEM, OAQ.

A test protocol, except as provided elsewhere in this permit, shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

no later than thirty-five (35) days prior to the intended test date. The Permittee shall submit a notice of the actual test date to the above address so that it is received at least two weeks prior to the test date.

- (b) All test reports must be received by IDEM, OAQ, within forty-five (45) days after the completion of the testing. An extension may be granted by the IDEM, OAQ, if the source submits to IDEM, OAQ, a reasonable written explanation within five (5) days prior to the end of the initial forty-five (45) day period.

The documentation submitted by the Permittee does not require certification by the "authorized individual" as defined by 326 IAC 2-1.1-1.

Compliance Monitoring Requirements

C.11 Compliance Monitoring [326 IAC 2-1.1-11]

Compliance with applicable requirements shall be documented as required by this permit. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment. All monitoring and record keeping requirements not already legally required shall be implemented when operation begins.

C.12 Monitoring Methods [326 IAC 3]

Any monitoring or testing required by Section D of this permit shall be performed according to the provisions of 326 IAC 3, 40 CFR 60, Appendix A, or other approved methods as specified in this permit.

C.13 Compliance Monitoring Plan - Failure to Take Response Steps [326 IAC 1-6]

- (a) The Permittee is required to implement a compliance monitoring plan to ensure that reasonable information is available to evaluate its continuous compliance with applicable requirements. This compliance monitoring plan is comprised of:
 - (1) This condition;
 - (2) The Compliance Determination Requirements in Section D of this permit;
 - (3) The Compliance Monitoring Requirements in Section D of this permit;
 - (4) The Record Keeping and Reporting Requirements in Section C (Monitoring Data Availability, General Record Keeping Requirements, and General Reporting Requirements) and in Section D of this permit; and
 - (5) A Compliance Response Plan (CRP) for each compliance monitoring condition of this permit. CRP's shall be submitted to IDEM, OAQ upon request and shall be subject to review and approval by IDEM, OAQ. The CRP shall be prepared within ninety (90) days after issuance of this permit by the Permittee and maintained on site, and is comprised of:
 - (A) Response steps that will be implemented in the event that compliance related information indicates that a response step is needed pursuant to the requirements of Section D of this permit; and
 - (B) A time schedule for taking such response steps including a schedule for devising additional response steps for situations that may not have been predicted.
- (b) For each compliance monitoring condition of this permit, appropriate response steps shall be taken when indicated by the provisions of that compliance monitoring condition. Failure to perform the actions detailed in the compliance monitoring conditions or failure to take the

response steps within the time prescribed in the Compliance Response Plan, shall constitute a violation of the permit unless taking the response steps set forth in the Compliance Response Plan would be unreasonable.

- (c) After investigating the reason for the excursion, the Permittee is excused from taking further response steps for any of the following reasons:
 - (1) The monitoring equipment malfunctioned, giving a false reading. This shall be an excuse from taking further response steps providing that prompt action was taken to correct the monitoring equipment.
 - (2) The Permittee has determined that the compliance monitoring parameters established in the permit conditions are technically inappropriate, has previously submitted a request for an administrative amendment to the permit, and such request has not been denied; or
 - (3) An automatic measurement was taken when the process was not operating; or
 - (4) The process has already returned to operating within "normal" parameters and no response steps are required.
- (d) Records shall be kept of all instances in which the compliance related information was not met and of all response steps taken.

C.14 Actions Related to Noncompliance Demonstrated by a Stack Test

- (a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall take appropriate corrective actions. The Permittee shall submit a description of these corrective actions to IDEM, OAQ, within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize emissions from the affected emissions unit while the corrective actions are being implemented. IDEM, OAQ shall notify the Permittee within thirty (30) days, if the corrective actions taken are deficient. The Permittee shall submit a description of additional corrective actions taken to IDEM, OAQ within thirty (30) days of receipt of the notice of deficiency. IDEM, OAQ reserves the authority to use enforcement activities to resolve noncompliant stack tests.
- (b) A retest to demonstrate compliance shall be performed within one hundred twenty (120) days of receipt of the original test results. Should the Permittee demonstrate to IDEM, OAQ that retesting in one-hundred and twenty (120) days is not practicable, IDEM, OAQ may extend the retesting deadline. Failure of the second test to demonstrate compliance with the appropriate permit conditions may be grounds for immediate revocation of the permit to operate the affected emissions unit.

The documents submitted pursuant to this condition do not require the certification by the "authorized individual" as defined by 326 IAC 2-1.1-1.

Record Keeping and Reporting Requirements

C.15 Malfunctions Report [326 IAC 1-6-2]

Pursuant to 326 IAC 1-6-2 (Records; Notice of Malfunction):

- (a) A record of all malfunctions, including startups or shutdowns of any facility or emission control equipment, which result in violations of applicable air pollution control regulations or

applicable emission limitations shall be kept and retained for a period of three (3) years and shall be made available to the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ) or appointed representative upon request.

- (b) When a malfunction of any facility or emission control equipment occurs which lasts more than one (1) hour, said condition shall be reported to OAQ, using the Malfunction Report Forms (2 pages). Notification shall be made by telephone or facsimile, as soon as practicable, but in no event later than four (4) daytime business hours after the beginning of said occurrence.
- (c) Failure to report a malfunction of any emission control equipment shall constitute a violation of 326 IAC 1-6, and any other applicable rules. Information of the scope and expected duration of the malfunction shall be provided, including the items specified in 326 IAC 1-6-2(a) (1) through (6).
- (d) Malfunction is defined as any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. [326 IAC 1-2-39]

C.16 Monitoring Data Availability [326 IAC 2-6.1-2] [IC 13-14-1-13]

- (a) With the exception of performance tests conducted in accordance with Section C- Performance Testing, all observations, sampling, maintenance procedures, and record keeping, required as a condition of this permit shall be performed at all times the equipment is operating at normal representative conditions.
- (b) As an alternative to the observations, sampling, maintenance procedures, and record keeping of subsection (a) above, when the equipment listed in Section D of this permit is not operating, the Permittee shall either record the fact that the equipment is shut down or perform the observations, sampling, maintenance procedures, and record keeping that would otherwise be required by this permit.
- (c) If the equipment is operating but abnormal conditions prevail, additional observations and sampling should be taken with a record made of the nature of the abnormality.
- (d) If for reasons beyond its control, the operator fails to make required observations, sampling, maintenance procedures, or record keeping, reasons for this must be recorded.
- (e) At its discretion, IDEM may excuse such failure providing adequate justification is documented and such failures do not exceed five percent (5%) of the operating time in any quarter.
- (f) Temporary, unscheduled unavailability of staff qualified to perform the required observations, sampling, maintenance procedures, or record keeping shall be considered a valid reason for failure to perform the requirements stated in (a) above.

C.17 General Record Keeping Requirements [326 IAC 2-6.1-2]

- (a) Records of all required monitoring data and support information shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. These records shall be kept at the source location for a minimum of three (3) years and available upon the request of an IDEM, OAQ, representative. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a written request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.

- (b) Records of required monitoring information shall include, where applicable:
 - (1) The date, place, and time of sampling or measurements;
 - (2) The dates analyses were performed;
 - (3) The company or entity performing the analyses;
 - (4) The analytic techniques or methods used;
 - (5) The results of such analyses; and
 - (6) The operating conditions existing at the time of sampling or measurement.
- (c) Support information shall include, where applicable:
 - (1) Copies of all reports required by this permit;
 - (2) All original strip chart recordings for continuous monitoring instrumentation;
 - (3) All calibration and maintenance records;
 - (4) Records of preventive maintenance shall be sufficient to demonstrate that failure to implement the Preventive Maintenance Plan did not cause or contribute to a violation of any limitation on emissions or potential to emit. To be relied upon subsequent to any such violation, these records may include, but are not limited to: work orders, parts inventories, and operator's standard operating procedures. Records of response steps taken shall indicate whether the response steps were performed in accordance with the Compliance Response Plan required by Section C - Compliance Monitoring Plan - Failure to take Response Steps, of this permit, and whether a deviation from a permit condition was reported. All records shall briefly describe what maintenance and response steps were taken and indicate who performed the tasks.
- (d) All record keeping requirements not already legally required shall be implemented when operation begins.

C.18 General Reporting Requirements [326 IAC 2-1.1-11] [326 IAC 2-6.1-2] [IC 13-14-1-13]

- (a) The reports required by conditions in Section D of this permit shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015
- (b) Unless otherwise specified in this permit, any notice, report, or other submission required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ, on or before the date it is due.
- (c) Unless otherwise specified in this permit, any semi-annual report shall be submitted within thirty (30) days of the end of the reporting period. The report does not require the

certification by the "authorized individual" as defined by 326 IAC 2-1.1-1(1).

- (d) All instances of deviations must be clearly identified in such reports. A reportable deviation is an exceedance of a permit limitation or a failure to comply with a requirement of the permit or a rule. It does not include:
- (1) An excursion from compliance monitoring parameters as identified in Section D of this permit unless tied to an applicable rule or limit; or
 - (2) A malfunction as described in 326 IAC 1-6-2; or
 - (3) Failure to implement elements of the Preventive Maintenance Plan unless lack of maintenance has caused or contributed to a deviation.
 - (4) Failure to make or record information required by the compliance monitoring provisions of Section D unless such failure exceeds 5% of the required data in any calendar quarter.

A Permittee's failure to take the appropriate response step when an excursion of a compliance monitoring parameter has occurred or failure to monitor or record the required compliance monitoring is a deviation.

- (e) Any corrective actions or response steps taken as a result of each deviation must be clearly identified in such reports.
- (f) The first report shall cover the period commencing on the date of issuance of this permit and ending on the last day of the reporting period.

C.19 Annual Notification [326 IAC 2-6.1-5(a)(5)]

- (a) Annual notification shall be submitted to the Office of Air Quality stating whether or not the source is in operation and in compliance with the terms and conditions contained in this permit.
- (b) Noncompliance with any condition must be specifically identified. If there are any permit conditions or requirements for which the source is not in compliance at any time during the year, the Permittee must provide a narrative description of how the source did or will achieve compliance and the date compliance was, or will be, achieved. The notification must be signed by an authorized individual.
- (c) The annual notice shall cover the time period from January 1 to December 31 of the previous year, and shall be submitted in the format attached no later than March 1 of each year to:
- Compliance Data Section, Office of Air Quality
Indiana Department of Environmental Management
100 North Senate Avenue, P.O. Box 6015
Indianapolis, IN 46206-6015
- (d) The notification shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ, on or before the date it is due.

SECTION D.1

EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description:

- (a) One (1) Cold Draw, known as EU01A, consisting of the following equipment:
- (1) One (1) natural gas-fired annealing furnace, known as EU01A-#10, installed in September 1988, exhausted to stacks F, G, and H, rated at 8.28 million British thermal units per hour, capacity: 5.0 tons per hour of steel.
 - (2) One (1) natural gas-fired annealing furnace, known as EU01A-#11, installed in September 1988, exhausted to stacks C, D, and E, rated at 9.54 million British thermal units per hour, capacity: 7.5 tons per hour of steel.
 - (3) Two (2) natural gas-fired boilers, known as EU01A-Boiler 1 and EU01A-Boiler 2, constructed in 1988, exhausting to stacks EU01A-T and EU01A-U, respectively, rated at 7.0 million British thermal units per hour and 5.0 million British thermal units per hour, respectively.
 - (4) Two (2) natural gas-fired tank heaters, known as EU01A-Z and EU01A-AA, constructed in February 1988, exhausting to the general facility, rated at 2.5 million British thermal units per hour, total.
 - (5) One (1) natural gas-fired annealing furnace, known as EU01A-#1, installed in 1961, exhausted to stacks P and AB, rated at 4.80 million British thermal units per hour, capacity: 13.0 tons per hour of steel.
 - (6) One (1) Micro-HN process boiler, known as EU01A-HN, installed in 2000, exhausted into the oxygen free tube curing process, rated at 11.6 million British thermal units per hour.
 - (7) Six (6) flame curtains, installed in 2000, rated at 0.264 million British thermal units per hour.
- (b) One (1) Weld Mill, known as EU01B, consisting of the following equipment:
- (1) One (1) natural gas-fired annealing furnace, known as EU01B-West, constructed in 1972, exhausting to stacks A, B, C, D, and E, rated at 17.1 million British thermal units per hour, capacity: 7.5 tons per hour of steel.
 - (2) Four (4) natural gas-fired unit heaters, known as EU01B-T1 through T4, installed in 1994, exhausted through stacks ST1 through ST4, respectively, rated at 1.60 million British thermal units per hour, total.
 - (3) One (1) natural gas-fired unit heater, known as EU01B-V, installed in 1972, exhausted through stack V, rated at 1.875 million British thermal units per hour.
 - (4) One (1) natural gas-fired annealing furnace, known as EU01B-East, constructed in 1988, exhausting to stacks K, R, and J, rated at 5.70 million British thermal units per hour, capacity: 7.5 tons per hour of steel.
 - (5) Four (4) flame curtains, installed in 2000, rated at 0.176 million British thermal units per hour.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

SECTION D.1 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description:

- (c) One (1) Hot Mill, known as EU01C, consisting of the following equipment:
 - (1) One (1) natural gas-fired billet heating furnace, known as EU01C-Billet Furnace, constructed in June 1988, exhausting to stack L and roof exhaust fan C9, rated at 30.0 million British thermal units per hour (modified from 26.0 million British thermal units per hour), capacity: 14.0 tons per hour of steel.
 - (2) One (1) natural gas-fired annealing furnace, known as EU01C-Annealing Furnace, constructed in June 1991, exhausting to stacks F, G, H, and roof exhaust fan C8, rated at 44.8 million British thermal units per hour, capacity: 9.0 tons per hour of steel.
 - (3) Two (2) natural gas-fired boilers, known as EU01C-Boiler 1 and EU01C-Boiler 2, constructed in August 1990, exhausting to stacks EU01C-M1 and EU01C-M2, respectively, rated at 7.0 million British thermal units per hour, each.
 - (4) Twenty-three (23) natural gas-fired unit heaters, known as EU01C-P1 through P12, EU01C-R1 through R6, EU01C-S1 and S2, EU01C-T1 and T2, and EU01C-U installed in 1994, rated at 6.95 million British thermal units per hour, total.
- (g) Two (2) metal inert gas (MIG) welding stations (for maintenance only).
- (h) Six (6) stick welding stations (for maintenance only).
- (i) Oxyacetylene flame-cutting (for maintenance only).
- (j) One (1) gasoline storage tank, capacity: 250 gallons, throughput: 858 gallons per year.
- (k) Two (2) diesel oil storage tanks, capacity: 250 gallons, each, throughput: 3,632 gallons per year, total.
- (l) One (1) kerosene storage tank, capacity: 250 gallon, throughput: 450 gallons per year.
- (m) Machining where an aqueous cutting coolant continuously floods the machining interface, using Emulsiplex Soluble Oil at 0.3 pounds per hour, capacity 38,250 pounds of steel per hour.
- (n) One (1) quarter mile unpaved stone road, supporting a maximum gross vehicle weight of thirty-five (35) tons of 18 wheel flatbed semi trailers, one (1) fork lift, and three (3) side loaders, a maximum of three (3) round trips per day, and a speed limit of five (5) miles per hour.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-6.1-5(1)]

D.1.1 Particulate Matter Limitation (PM) [326 IAC 6-2-4]

- (a) Pursuant to 326 IAC 6-2-4, the PM emissions from EU01A-Boiler 1 and EU01A-Boiler 2, shall not exceed 0.571 pounds per million British thermal units.
- (b) Pursuant to 326 IAC 6-2-4, the PM emissions from EU01A-HN, shall not exceed 0.425 pounds per million British thermal units.

- (c) Pursuant to 326 IAC 6-2-4, the PM emissions from EU01C-Boiler 1 and EU01C-Boiler 2, shall not exceed 0.467 pounds per million British thermal units.

The limits stated above were based on the following equation:

$$Pt = 1.09/Q^{0.26}$$

where:

Pt = Pounds of particulate matter emitted per million British thermal units (lb/MMBtu) heat input

Q = Total source maximum operating capacity rating in million British thermal units per hour (MMBtu/hr) heat input. The maximum operating capacity rating is defined as the maximum capacity at which the facility is operated or the nameplate capacity, whichever is specified in the facility's permit application, except when some lower capacity is contained in the facility's operation permit; in which case, the capacity specified in the operation permit shall be used.

These limits will also make the requirements of 326 IAC 2-2 not applicable.

D.1.2 Particulate Matter (PM) [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2 (Process Operations), the allowable PM emission rate from the maintenance welding and flame cutting operations shall be limited by the following equation:

Interpolation of the data for the process weight rate up to 60,000 pounds per hour shall be accomplished by use of the equation:

$$E = 4.10 P^{0.67} \quad \text{where } E = \text{rate of emission in pounds per hour; and} \\ P = \text{process weight rate in tons per hour.}$$

D.1.3 CO and NO_x Emissions

Any change or modification which may increase potential to emit CO and/or NO_x from the entire source to one hundred (100) tons per year or more shall require approval from IDEM, OAQ prior to making the change.

D.1.4 Preventive Maintenance Plan [326 IAC 1-6-3]

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for this emissions unit and any control devices.

Compliance Determination Requirements [326 IAC 2-1.1-11]

There are no specific Compliance Determination Requirements applicable to these emission units.

Compliance Monitoring Requirements [326 IAC 2-5.1-3(e)(2)] [326 IAC 2-6.1-5(a)(2)]

There are no specific Compliance Monitoring Requirements applicable to these emission units.

Record Keeping and Reporting Requirements [326 IAC 2-5.1-3(e)(2)] [326 IAC 2-6.1-5(a)(2)]

D.1.5 Record Keeping Requirements [40CFR 60.48c, NSPS Subpart Dc]

- (a) The Permittee shall maintain monthly records of the amount and type of fuel burned in the EU01A-HN pursuant to 40 CFR 60.48c, Subpart Dc.

- (b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

D.1.6 Natural Gas Fired Boiler Certification

An annual certification shall be submitted to the address listed in Section C - General Reporting Requirements, of this permit, using the Natural Gas Fired Boiler Certification form located at the end of this permit, or its equivalent, no later than July 1 of each year.

SECTION D.2 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description:

- (f) One (1) natural gas-fired emergency generator, exhausted through stack GEN-1, rated at 0.649 million British thermal units per hour.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-6.1-5(1)]

D.2.1 Operation Limitation

Pursuant to the definition of emergency generators, operation of the one (1) generator, identified as GEN-1, shall be limited to an annual total of 500 hours.

Record Keeping and Reporting Requirements [326 IAC 2-5.1-3(e)(2)] [326 IAC 2-6.1-5(a)(2)]

D.2.2 Record Keeping Requirements

- (a) To document compliance with Condition D.2.1, the Permittee shall maintain records of the following:
- (1) The hours of operation of each emergency generator;
 - (2) Records of the annual fuel usage of the emergency generator.
- (b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements of this permit.

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION**

**MINOR SOURCE OPERATING PERMIT
SEMI-ANNUAL NATURAL GAS-FIRED BOILER CERTIFICATION**

Source Name: Plymouth Tube Company
Source Address: 504 North Keller Avenue, Winamac, Indiana 46996
Mailing Address: P.O. Box 278, Winamac, Indiana 46996
Permit No.: MSOP 131-7690-00014

9	Natural Gas Only	
9	Alternate Fuel burned	
	From: _____	To: _____

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature:

Printed Name:

Title/Position:

Phone:

Date:

A certification by the responsible official as defined by 326 IAC 2-7-1(34) is required for this report.

MALFUNCTION REPORT

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
FAX NUMBER - 317 233-5967**

**This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6
and to qualify for the exemption under 326 IAC 1-6-4.**

THIS FACILITY MEETS THE APPLICABILITY REQUIREMENTS BECAUSE IT HAS POTENTIAL TO EMIT 25 TONS/YEAR PARTICULATE MATTER ?_____, 25 TONS/YEAR SULFUR DIOXIDE ?_____, 25 TONS/YEAR NITROGEN OXIDES ?_____, 25 TONS/YEAR VOC ?_____, 25 TONS/YEAR HYDROGEN SULFIDE ?_____, 25 TONS/YEAR TOTAL REDUCED SULFUR ?_____, 25 TONS/YEAR REDUCED SULFUR COMPOUNDS ?_____, 25 TONS/YEAR FLUORIDES ?_____, 100 TONS/YEAR CARBON MONOXIDE ?_____, 10 TONS/YEAR ANY SINGLE HAZARDOUS AIR POLLUTANT ?_____, 25 TONS/YEAR ANY COMBINATION HAZARDOUS AIR POLLUTANT ?_____, 1 TON/YEAR LEAD OR LEAD COMPOUNDS MEASURED AS ELEMENTAL LEAD ?_____, OR IS A SOURCE LISTED UNDER 326 IAC 2-5.1-3(2) ?_____. EMISSIONS FROM MALFUNCTIONING CONTROL EQUIPMENT OR PROCESS EQUIPMENT CAUSED EMISSIONS IN EXCESS OF APPLICABLE LIMITATION _____.

THIS MALFUNCTION RESULTED IN A VIOLATION OF: 326 IAC _____ OR, PERMIT CONDITION # _____ AND/OR PERMIT LIMIT OF _____

THIS INCIDENT MEETS THE DEFINITION OF 'MALFUNCTION' AS LISTED ON REVERSE SIDE ? Y N

THIS MALFUNCTION IS OR WILL BE LONGER THAN THE ONE (1) HOUR REPORTING REQUIREMENT ? Y N

COMPANY: Plymouth Tube Company PHONE NO. : _____
LOCATION: (CITY AND COUNTY) Winamac, IN Pulaski County
PERMIT NO. 131-7690 AFS PLANT ID: 131-00014 AFS POINT ID: _____ INSP: _____
CONTROL/PROCESS DEVICE WHICH MALFUNCTIONED AND REASON: _____

DATE/TIME MALFUNCTION STARTED: _____ / _____ / 20____ AM / PM

ESTIMATED HOURS OF OPERATION WITH MALFUNCTION CONDITION: _____

DATE/TIME CONTROL EQUIPMENT BACK-IN SERVICE _____ / _____ / 20____ AM / PM

TYPE OF POLLUTANTS EMITTED: TSP, PM-10, SO₂, VOC, OTHER: _____

ESTIMATED AMOUNT OF POLLUTANT EMITTED DURING MALFUNCTION: _____

MEASURES TAKEN TO MINIMIZE EMISSIONS: _____

REASONS WHY FACILITY CANNOT BE SHUTDOWN DURING REPAIRS:

CONTINUED OPERATION REQUIRED TO PROVIDE ESSENTIAL* SERVICES: _____
CONTINUED OPERATION NECESSARY TO PREVENT INJURY TO PERSONS: _____
CONTINUED OPERATION NECESSARY TO PREVENT SEVERE DAMAGE TO EQUIPMENT: _____
INTERIM CONTROL MEASURES: (IF APPLICABLE) _____

MALFUNCTION REPORTED BY: _____ TITLE: _____
(SIGNATURE IF FAXED)

MALFUNCTION RECORDED BY: _____ DATE: _____ TIME: _____

**Please note - This form should only be used to report malfunctions
applicable to Rule 326 IAC 1-6 and to qualify for
the exemption under 326 IAC 1-6-4.**

326 IAC 1-6-1 Applicability of rule

Sec. 1. This rule applies to the owner or operator of any facility required to obtain a permit under 326 IAC 2-5.1 or 326 IAC 2-6.1.

326 IAC 1-2-39 "Malfunction" definition

Sec. 39. Any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner.

* **Essential services** are interpreted to mean those operations, such as, the providing of electricity by power plants. Continued operation solely for the economic benefit of the owner or operator shall not be sufficient reason why a facility cannot be shutdown during a control equipment shutdown.

If this item is checked on the front, please explain rationale:

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION**

**MINOR SOURCE OPERATING PERMIT
ANNUAL NOTIFICATION**

This form should be used to comply with the notification requirements under 326 IAC 2-6.1-5(a)(5).

Company Name:	Plymouth Tube Company
Address:	504 North Keller Avenue
City:	Winamac, Indiana 46996
Phone #:	219-946-6657
MSOP #:	131-7690-00014

I hereby certify that Plymouth Tube Company is ☒ still in operation.
☐ no longer in operation.

I hereby certify that Plymouth Tube Company is ☒ in compliance with the requirements of MSOP 131-7690-00014.
☐ not in compliance with the requirements of MSOP 131-7690-00014.

Authorized Individual (typed):	Clayton R. Conway
Title:	
Signature:	
Date:	

If there are any conditions or requirements for which the source is not in compliance, provide a narrative description of how the source did or will achieve compliance and the date compliance was, or will be achieved.

Noncompliance:

**Indiana Department of Environmental Management
Office of Air Quality**

**Technical Support Document (TSD) for a
Minor Source Operating Permit**

Source Background and Description

Source Name:	Plymouth Tube Company
Source Location:	504 North Keller Avenue, Winamac, Indiana 46996
County:	Pulaski
SIC Code:	3317
Operation Permit No.:	MSOP 131-7690-00014
Permit Reviewer:	Paula M. Cognitore

History

The Office of Air Quality (OAQ) has reviewed an application from the Plymouth Tube Company relating to the modification and operation of a seamless steel pipe and tube production source. The source was previously permitted as an existing minor PSD source, pursuant to CP 131-2964-00014, issued on April 15, 1994. However, a November 15, 1996 stack test showed that actual CO emissions from the source exceeded 250 tons per year. The source never received PSD approval for these major CO emissions. A notice of violation for the CO emissions exceeding 250 tons per year during 1996, 1997 and 1998 was issued to the source on April 17, 2000.

The process of producing steel pipes and tubes requires an oxygen free environment in order to prevent the oxidation of the steel pipes and tubes while curing. The oxygen free environment allows the product to obtain the finish necessary for customer acceptance. As a resolution to make the requirements of 326 IAC 2-2 not applicable the DX Generators which produced the CO were replaced by a Micro-HN process. The Micro-HN process produces an oxygen free environment through the production of excess hydrogen and nitrogen and eliminates the production of excess CO. As a result potential CO emissions from this source were reduced from 4,948 tons per year to 63.9 tons per year. Therefore this source is no longer subject to the requirements of 326 IAC 2-2, 326 IAC 2-7 and will be issued an MSOP pursuant to 326 IAC 2-6.

Permitted Emission Units and Pollution Control Equipment

The source consists of the following permitted emission units and pollution control devices:

- (a) One (1) Cold Draw, known as EU01A, consisting of the following equipment:
 - (1) One (1) natural gas-fired annealing furnace, known as EU01A-#10, installed in September 1988, exhausted to stacks F, G, and H, rated at 8.28 million British thermal units per hour, capacity: 5.0 tons per hour of steel.
 - (2) One (1) natural gas-fired annealing furnace, known as EU01A-#11, installed in September 1988, exhausted to stacks C, D, and E, rated at 9.54 million British thermal units per hour, capacity: 7.5 tons per hour of steel.

- (3) Two (2) natural gas-fired boilers, known as EU01A-Boiler 1 and EU01A-Boiler 2, installed in 1988, exhausting to stacks EU01A-T and EU01A-U, respectively, rated at 7.0 million British thermal units per hour and 5.0 million British thermal units per hour, respectively.
- (4) Two (2) natural gas-fired tank heaters, known as EU01A-Z and EU01A-AA, installed in February 1988, exhausting to the general facility, rated at 2.5 million British thermal units per hour, total.
- (b) One (1) Weld Mill, known as EU01B, consisting of the following equipment:
 - (1) One (1) natural gas-fired annealing furnace, known as EU01B-West, installed in 1972, exhausting to stacks A, B, C, D, and E, rated at 17.1 million British thermal units per hour, capacity: 7.5 tons per hour of steel.
 - (2) Four (4) natural gas-fired unit heaters, known as EU01B-T1 through T4, installed in 1994, exhausted through stacks ST1 through ST4, respectively, rated at 1.60 million British thermal units per hour, total.
 - (3) One (1) natural gas-fired unit heater, known as EU01B-V, installed in 1972, exhausted through stack V, rated at 1.875 million British thermal units per hour.
- (c) One (1) Hot Mill, known as EU01C, consisting of the following equipment:
 - (1) One (1) natural gas-fired billet heating furnace, known as EU01C-Billet Furnace, installed in June 1988, exhausting to stack L and roof exhaust fan C9, rated at 30.0 million British thermal units per hour (modified from 26.0 million British thermal units per hour), capacity: 14.0 tons per hour of steel.
 - (2) One (1) natural gas-fired annealing furnace, known as EU01C-Annealing Furnace, installed in June 1991, exhausting to stacks F, G, H, and roof exhaust fan C8, rated at 44.8 million British thermal units per hour, capacity: 9.0 tons per hour of steel.
 - (3) Two (2) natural gas-fired boilers, known as EU01C-Boiler 1 and EU01C-Boiler 2, installed in August 1990, exhausting to stacks EU01C-M1 and EU01C-M2, respectively, rated at 7.0 million British thermal units per hour, each.
 - (4) Twenty-three (23) natural gas-fired unit heaters, known as EU01C-P1 through P12, EU01C-R1 through R6, EU01C-S1 and S2, EU01C-T1 and T2, and EU01C-U installed in 1994, rated at 6.95 million British thermal units per hour, total. (Heaters P13-16 & R7 & 8 have been removed)

Unpermitted Emission Units and Pollution Control Equipment

The source also consists of the following unpermitted facilities/units:

- (d) EU01A has added the following equipment:
 - (1) One (1) natural gas-fired annealing furnace, known as EU01A-#1, installed in 1961, exhausted to stacks P and AB, rated at 4.80 million British thermal units per hour, capacity: 13.0 tons per hour of steel.

- (2) One (1) Micro-HN process boiler, known as EU01A-HN, installed in 2000, exhausted into the oxygen free tube curing process, rated at 11.6 million British thermal units per hour.
- (3) Six (6) flame curtains, installed in 2000, rated at 0.264 million British thermal units per hour.
- (e) EU01B has added the following equipment:
 - (1) One (1) natural gas-fired annealing furnace, known as EU01B-East, installed in 1988, exhausting to stacks K, R, and J, rated at 5.70 million British thermal units per hour, capacity: 7.5 tons per hour of steel.
 - (2) Four (4) flame curtains, installed in 2000, rated at 0.176 million British thermal units per hour.
- (f) One (1) natural gas-fired emergency generator, exhausted through stack GEN-1, rated at 0.649 million British thermal units per hour.
- (g) Two (2) metal inert gas (MIG) welding stations (for maintenance only).
- (h) Six (6) stick welding stations (for maintenance only).
- (i) Oxyacetylene flame-cutting (for maintenance only).
- (j) One (1) gasoline storage tank, capacity: 250 gallons, throughput: 858 gallons per year.
- (k) Two (2) diesel oil storage tanks, capacity: 250 gallons, each, throughput: 3,632 gallons per year, total.
- (l) One (1) kerosene storage tank, capacity: 250 gallon, throughput: 450 gallons per year.
- (m) Machining where an aqueous cutting coolant continuously floods the machining interface, using Emulsiplex Soluble Oil at 0.3 pounds per hour, capacity 38,250 pounds of steel per hour.
- (n) One (1) quarter mile unpaved stone road, supporting a maximum gross vehicle weight of thirty-five (35) tons of 18 wheel flatbed semi trailers, one (1) fork lift, and three (3) side loaders, a maximum of three (3) round trips per day, and a speed limit of five (5) miles per hour.

New Emission Units

There are no new emission units at the source.

Existing Approvals

The source has been operating under previous approvals including but not limited to the following:

CP 131-2964-00014, issued on April 15, 1994

All conditions from previous approvals were incorporated into this permit except the following:

Condition 4 of CP 131-2945-00014, issued on April 15, 1994

That particulate matter emissions from the four boilers shall comply with 326 6-2 (Particulate Emission Limitation for sources of Indirect Heating). Particulate matter emissions from the four boilers shall be limited to 0.47 pounds per million BTU heat input, pursuant to the rule.

Reason not carried through:

Although the rule cite is correct the limit was not calculated correctly. Two of the four boilers were installed in 1988 (EU01A-Boiler 1 and EU01A-Boiler 2) and the other two boilers (EU01C-Boiler 1 and EU01C-Boiler 2) were installed in 1990. Therefore, two separate limits should have been calculated.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (EF)
Cold Draw					
EU01A-C	#11 Annealing Furnace	40.83	1.50	900	260
EU01A-D	#11 Annealing Furnace	40.83	2.67	16,495	77
EU01A-E	#11 Annealing Furnace	40.83	1.50	900	230
EU01A-F	#10 Annealing Furnace	36.33	2.00	1,500	165
EU01A-G	#10 Annealing Furnace	36.33	2.67	16,495	77
EU01A-H	#10 Annealing Furnace	36.33	2.00	1,500	330
EU01A-P	#1 Annealing Furnace	30.0	1.50	2,000	165
EU01A-AB	#1 Annealing Furnace	30.0	2.60	12,125	77
EU01A-T	Boiler 1 (removed 3/00)	30.83	2.00	440	350
EU01A-U	Boiler 2 (removed 3/00)	21.0	2.00	600	280
EU01A-S1	Roof Exhaust Fan	44.25	5.00	43,000	77
EU01A-S2	Roof Exhaust Fan	44.25	5.00	43,000	77
EU01A-V	Roof Exhaust Fan	44.83	5.00	43,000	77
EU01A-W1	Roof Exhaust Fan	44.83	5.00	52,500	77
EU01A-W2	Roof Exhaust Fan	44.83	5.00	52,500	77
EU01A-W3	Roof Exhaust Fan	36.33	5.00	52,500	77
EU01A-W4	Roof Exhaust Fan	36.33	5.00	52,500	77
EU01A-X	Roof Exhaust Fan	44.83	5.00	43,000	77
Weld Mill					
EU01B-A	West Annealing Furnace	48.0	1.50	7,915	77
EU01B-B	West Annealing Furnace	48.0	1.50	7,915	77

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (EF)
EU01B-C	West Annealing Furnace	48.0	1.50	1,700	275
EU01B-D	West Annealing Furnace	48.0	1.50	10,000	140
EU01B-E	West Annealing Furnace	48.0	1.50	1,245	85
EU01B-K	East Annealing Furnace	48.0	1.50	990	85
EU01B-R	East Annealing Furnace	48.0	1.50	990	85
EU01B-J	East Annealing Furnace	48.0	1.50	990	85
EU01B-ST1 - ST4	Four (4) Unit Heaters	30.0	0.67	unk	unk
EU01B-L	Roof Exhaust Fan	20.75	4.00	32,000	77
EU01B-M	East Annealing Furnace	14.0	2.00	unk	unk
EU01B-N	Open Exhaust Fan	14.0	2.00	unk	unk
EU01B-P	Open Exhaust Fan	14.0	2.00	unk	unk
EU01B-V	1.875 MMBtu/hr NG Heater	24.0	0.83	unk	unk
Hot Mill					
EU01C-C1 - C7	Seven (7) Roof Exhaust Fans	33.0	5.00	43,000	77
EU01C-C8	Annealing Furnace	33.0	5.00	43,000	77
EU01C-C9	Billet Furnace	33.0	5.00	43,000	77
EU01C-E	Roof Exhaust Fan	33.0	4.00	32,000	77
EU01C-F	Annealing Furnace	45.5	2.50	1,440	330
EU01C-G	Annealing Furnace	45.5	2.67	1,300	330
EU01C-H	Annealing Furnace	45.5	2.00	1,300	330
EU01C-L	Billet Furnace	45.67	2.50	15,940	400
EU01C-M1	Boiler 1	20.67	1.67	600	280
EU01C-M2	Boiler 2	20.67	1.67	600	280
EU01C-P1 - P12	Twelve (12) Unit Heaters	2@ 14.0 10@ 24.0	2@ 0.33 10@ 0.50	unk	unk
EU01C-R1 - R6	Six (8) Unit Heaters	32.0	0.50	unk	unk
EU01C-S1 and S2	Two (2) Unit Heaters	32.0 32.0	0.50 0.33	unk	unk
EU01C-T1 and T2	Two (2) Unit Heaters	32.0	0.33	unk	unk
EU01C-U	Unit Heater	28.0	0.33	unk	unk
GEN-1	Emergency Generator	44.83	0.208	unk	unk

Enforcement Issue

- (a) IDEM is aware that equipment has been constructed and operated prior to receipt of the proper permit. The subject equipment is listed in this Technical Support Document under the condition entitled *Unpermitted Emission Units and Pollution Control Equipment*.
- (b) IDEM is reviewing this matter and will take appropriate action. This proposed permit is intended to satisfy the requirements of the construction permit rules.
- (c) A notice of violation for the CO emissions exceeding 250 tons per year during 1996, 1997 and 1998 was issued to the source on April 17, 2000.

Recommendation

The staff recommends to the Commissioner that the operation be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on December 14, 1996, with additional information received on September 14 and October 29, 1998, April 5, 1999, March 13 and April 25 2000 and March 21, 2001.

Emission Calculations

See pages 1 through 14 of Appendix A of this document for detailed emissions calculations.

Potential To Emit

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, the department, or the appropriate local air pollution control agency.”

Pollutant	Potential To Emit (tons/year)
PM	2.10
PM ₁₀	5.94
SO ₂	0.450
VOC	4.15
CO	63.9
NO _x	75.5

HAPs	Potential To Emit (tons/year)
Benzene	0.002
Dichlorobenzene	5.74
Formaldehyde	0.056
Hexane	1.35
Toluene	0.003
Lead	0.0004
Cadmium	0.0008
Chromium	0.001
Manganese	0.0003
Nickel	0.002
TOTAL	1.22

- (a) The potential to emit (as defined in 326 IAC 2-1.1-1(16)) of NO_x and CO are equal to or greater than 25 tons per year, but less than 100 tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-6.1.
- (b) The potential to emit (as defined in 326 IAC 2-7-1(29)) of any single HAP is less than ten (10) tons per year and the potential to emit (as defined in 326 IAC 2-7-1(29)) of a combination HAPS is less than or equal to twenty-five (25) tons per year. Therefore, the source is not subject to the provisions of 326 IAC 2-7.

Actual Emissions

The following table shows the actual emissions from the source. This information reflects the 1999 OAQ emission data.

Pollutant	Actual Emissions (tons/year)
PM	not listed
PM ₁₀	1.27
SO ₂	0.100
VOC	0.916
CO	537
NO _x	47.9
HAP	not listed

Limited Potential to Emit

The table below summarizes the total potential to emit, reflecting all limits, of the significant emission units.

	Limited Potential to Emit (tons/year)						
Process/facility	PM	PM ₁₀	SO ₂	VOC	CO	NO _x	HAPS
EU01A Cold Draw (except for boilers)	0.212	0.846	0.066	0.612	10.2	11.1	0.276
EU01A-Boiler 1 & EU01A-Boiler 2	30.0	0.399	0.032	0.289	4.42	5.26	0.116
EU01A-HN	21.6	0.386	0.031	0.279	4.27	5.08	0.068
EU01B Weld Mill	0.220	0.881	0.069	0.637	9.73	11.6	0.219
EU01C Hot Mill (except for boilers)	0.681	2.72	0.215	1.97	30.1	35.7	0.427
EU01C-Boiler 1 & EU01C-Boiler 2	28.6	0.466	0.037	0.337	5.15	6.13	0.116
Emergency Generator	0.002	0.002	0.000	0.019	0.0647	0.461	0.000
Unpaved Roads	0.671	0.235	0.000	0.000	0.000	0.000	0.000
Total Emissions	82.0	5.94	0.450	4.14	63.9	75.3	1.22

County Attainment Status

The source is located in Pulaski County.

Pollutant	Status
PM ₁₀	attainment
SO ₂	attainment
NO ₂	attainment
Ozone	attainment
CO	attainment
Lead	attainment

- (a) Volatile organic compounds (VOC) and oxides of nitrogen (NO_x) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule

applicability relating to the ozone standards. Pulaski County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NO_x emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

- (b) Pulaski County has been classified as attainment or unclassifiable for all remaining criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (c) Fugitive Emissions
Since this type of operation is not one of the 28 listed source categories under 326 IAC 2-2, 40 CFR 52.21, or 326 IAC 2-3 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

Source Status

New Source PSD Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity and/ or as otherwise limited):

Pollutant	Emissions (ton/yr)
PM	2.10
PM ₁₀	5.94
SO ₂	0.450
VOC	4.15
CO	63.9
NO _x	75.5
Single HAP	1.35
Combination HAPS	1.42

This new source is **not** a major stationary source because no attainment pollutant is emitted at a rate of 250 tons per year or greater and it is not in one of the 28 listed source categories. Therefore, pursuant to 326 IAC 2-2, and 40 CFR 52.21, the PSD requirements do not apply.

Part 70 Permit Determination

This source is not subject to the Part 70 Permit requirements because the potential to emit (PTE) of:

- (a) each criteria pollutant is less than one hundred (100) tons per year,
- (b) a single hazardous air pollutant (HAP) is less than ten (10) tons per year, and
- (c) any combination of HAPS is less than twenty-five (25) tons/year.

Federal Rule Applicability

- (a) The four (4) natural gas-fired boilers, known as EU-01A-Boiler 1, EU01B-Boiler 2, EU1C-Boiler 1 and EU01C-Boiler 2 are not subject to the requirements of the New Source Performance Standard, 326 IAC 12, 40 CFR 60.40, 40 CFR 60.40a, 40CFR 60.40b and 40 CFR 60.40c, Subparts D, Da, Db and Dc because their capacities are less than 10 million British thermal units per hour.
- (b) The one (1) Micro-HN process boiler is subject to the New Source Performance Standard, 326 IAC 12, (40 CFR 60.40c, Subpart Dc because it was installed after the June 9, 1989 applicability date and is rated between 10 and 100 million British thermal units per hour. Since the boiler only operates on natural gas, there are no applicable standards under 40 CFR 60.42c. The source shall record the amount of fuel used pursuant to 40 CFR 60.48c(g).
- (c) The four (4) storage tanks are not subject to the requirements of the New Source Performance Standard, 326 IAC 12, (40 CFR 60.110a and 60.110b), Subparts K, Ka and Kb, because each tank has a capacity less than 40 cubic meters.
- (d) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR art 63) applicable to this source.

State Rule Applicability - Entire Source

326 IAC 2-6 (Emission Reporting)

This source is located in Pulaski County and the potential to emit CO and NO_x is less than one hundred (100) tons per year, therefore, 326 IAC 2-6 does not apply.

326 IAC 5-1 (Opacity Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary alternative opacity limitations), opacity shall meet the following, unless otherwise stated in this permit:

- (a) Opacity shall not exceed an average of forty percent (40%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

State Rule Applicability - Individual Facilities

326 IAC 6-2-4 (Particulate emissions limitation for facilities constructed after September 21, 1983)

- (a) The two (2) boilers, known as EU01A-Boiler 1 and EU01A-Boiler 2, installed in 1988, must comply with the requirements of 326 IAC 6-2-4. The emission limitations are based on the following equation in 326 IAC 6-2-4:

$$Pt = 1.09/Q^{0.26}$$

where:

Pt = Pounds of particulate matter emitted per million British thermal units (lb/MMBtu) heat input

Q = Total source maximum operating capacity rating in million British thermal units per hour (MMBtu/hr) heat input. The maximum operating capacity rating is defined as the maximum capacity at which the facility is operated or the nameplate capacity, whichever is specified in the facility's permit application, except when some lower capacity is contained in the facility's operation permit; in which case, the capacity specified in the operation permit shall be used.

For the two (2) boilers, known as EU01A-Boiler 1 and EU01A-Boiler 2:

The heat input capacity of the two (2) boilers is 12.0 million British thermal units per hour.

$$Pt = 1.09/(12.0)^{0.26} = 0.571 \text{ lb/MMBtu heat input}$$

Based on Appendix A, the potential PM emission rate is:

$$0.09999 \text{ ton/yr} * (2000 \text{ lbs/ton} / 8760 \text{ hrs/yr}) = 0.0228 \text{ lb/hr}$$

$$(0.0228 \text{ lb/hr} / 12.0 \text{ MMBtu/hr}) = 0.0019 \text{ lb PM/MMBtu}$$

Therefore, the two (2) boilers, known as EU01A-Boiler 1 and EU01A-Boiler 2, will comply with this rule.

- (b) The two (2) boilers, known as EU01C-Boiler 1 and EU01C-Boiler 2, installed in 1990, must comply with the requirements of 326 IAC 6-2-4.

For the two (2) boilers, known as EU01C-Boiler 1 and EU01C-Boiler 2:

The heat input capacity of the two (2) boilers is 14.0 million British thermal units per hour. There were two boilers with a total heat input capacity of 12.0 MMBtu per hour when these boilers were installed; therefore the total Q is 26.0 MMBtu per hour.

$$Pt = 1.09/(26.0)^{0.26} = 0.467 \text{ lb/MMBtu heat input}$$

Based on Appendix A, the potential PM emission rate is:

$$0.1170 \text{ ton/yr} * (2000 \text{ lbs/ton} / 8760 \text{ hrs/yr}) = 0.0267 \text{ lb/hr}$$

$$(0.0267 \text{ lb/hr} / 14.0 \text{ MMBtu/hr}) = 0.0019 \text{ lb PM/MMBtu}$$

Therefore, the two (2) boilers, known as EU01C-Boiler 1 and EU01C-Boiler 2, will comply with this rule.

- (c) The one (1) Micro-HN process boiler, known as EU01A-HN, installed in 2000, must comply with the requirements of 326 IAC 6-2-4.

For the one (1) boiler, known as EU01A-HN:

The heat input capacity of the one (1) boiler is 11.6 million British thermal units per hour. There were four (4) boilers rated at 26.0 million British thermal units per hour, total, in operation when this boiler was constructed. Therefore the total Q is 37.6 MMBtu per hour.

$$Pt = 1.09/(37.6)^{0.26} = 0.425 \text{ lb/MMBtu heat input}$$

Based on Appendix A, the potential PM emission rate is:

$$0.0965 \text{ ton/yr} * (2000 \text{ lbs/ton} / 8760 \text{ hrs/yr}) = 0.022 \text{ lb/hr} \\ (0.022 \text{ lb/hr} / 11.6 \text{ MMBtu/hr}) = 0.0019 \text{ lb PM/MMBtu}$$

Therefore, the one (1) Micro-HN process boiler, known as EU01A-HN, will comply with this rule.

Testing Requirements

No testing is required because all combustion is on natural gas.

Conclusion

The operation of this seamless steel pipe and tube production source shall be subject to the conditions of the attached proposed Minor Source Operating Permit 131-7690-00014.

Appendix A: Total Potential Emissions

Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
Permit No.: MSOP 131-7690
Plt ID: 131-00014
Reviewer: Paula M. Cognitore
Date: December 13, 1996

**Potential Criteria Pollutants
(tons/year)**

EU01A Cold Draw		PM	PM10	SO2	NOx	VOC	CO
#10 Annealing Furnace	8.28 MMBtu/hr	0.0689	0.276	0.0218	3.63	0.199	3.05
#11 Annealing Furnace	9.54 MMBtu/hr	0.0794	0.318	0.0251	4.18	0.230	3.51
#1 Annealing Furnace	4.80 MMBtu/hr	0.0399	0.160	0.0126	2.10	0.116	1.77
Boiler 1 (backup)	7.0 MMBtu/hr	0.0583	0.233	0.0184	3.07	0.169	2.58
Boiler 2	5.0 MMBtu/hr	0.0416	0.1660	0.01310	2.19	0.1200	1.840
Unit Heaters (Z, AA)	2.50 MMBtu/hr	0.0208	0.0832	0.00657	1.10	0.0602	0.920
Micro-HN Boiler	11.6 MMBtu/hr	0.0965	0.386	0.0305	5.08	0.279	4.27
Six (6) Flame Curtains	0.264 MMBtu/hr	0.00220	0.00879	0.000694	0.116	0.00636	0.971
EU01A Cold Draw Total		0.408	1.631	0.129	21.466	1.180	18.911

EU01B Weld Mill		PM	PM10	SO2	NOx	VOC	CO
West Annealing	17.1 MMBtu/hr	0.142	0.569	0.0449	7.49	0.412	6.29
East Annealing	5.70 MMBtu/hr	0.0474	0.190	0.0150	2.50	0.137	2.10
Unit Heaters (T1-T4)	1.60 MMBtu/hr	0.0133	0.0533	0.00420	0.701	0.0385	0.589
One (1) Unit Heater (V)	1.875 MMBtu/hr	0.0156	0.0624	0.00493	0.821	0.0452	0.690
Four (4) Flame Curtains	0.176 MMBtu/hr	0.00146	0.00586	0.000463	0.0771	0.00424	0.0648
EU01B Weld Mill Total		0.220	0.881	0.069	11.589	0.637	9.734

EU01C Hot Mill		PM	PM10	SO2	NOx	VOC	CO
Billet Furnace	30.0 MMBtu/hr	0.250	1.00	0.0788	13.1	0.723	11.0
Annealing Furnace	44.8 MMBtu/hr	0.373	1.49	0.118	19.6	1.08	16.5
Boiler 1 & 2	14.00 MMBtu/hr	0.1170	0.466	0.0368	6.13	0.337	5.15
23 Unit Heaters	6.95 MMBtu/hr	0.0578	0.231	0.0183	3.04	0.167	2.56
EU01C Hot Mill Total		0.798	3.187	0.252	41.870	2.307	35.210

Other		PM	PM10	SO2	NOx	VOC	CO
Emergency Generator	0.649 MMBtu/hr	0.00162	0.00162	0.0000974	0.461	0.0188	0.0647
Unpaved Roads		0.671	0.235	0.00	0.00	0.00	0.00
Storage Tanks		n/a	n/a	n/a	n/a	n/a	n/a
Welding and Cutting		n/a	n/a	n/a	n/a	n/a	n/a

	PM	PM10	SO2	NOx	VOC	CO
TOTAL	2.10	5.94	0.450	75.4	4.14	63.9

Appendix A: Emissions Calculations

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Natural Gas Combustion Only MM BTU/HR <100 Small Industrial Boilers, Annealing Furnaces, and Space Heaters

Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
Permit No.: MSOP 131-7690
Plt ID: 131-00014
Reviewer: Paula M. Cognitore
Date: December 13, 1996

EU01A Cold Draw

EU01A Cold Draw - #10 Annealing Furnace

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

8.28

72.5

Emission Factor in lb/MMCF	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.0689	0.276	0.0218	3.63	0.199	3.05

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	0.0000762	0.0000435	0.00272	0.0653	0.000123

HAPs - Metals					
Emission Factor in lb/MMcf	Lead	Cadmium	Chromium	Manganese	Nickel
	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	0.0000181	0.0000399	0.0000508	0.0000138	0.0000762
Total Combined HAPs:					0.0684

Methodology:

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

PM emission factors are condensable and filterable.

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98)

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

The five highest organic and metal HAPs emission factors are provided above.

Additional HAPs emission factors are available in AP-42, Chapter 1.4.

Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100
Small Industrial Boilers, Annealing Furnaces, and Space Heaters

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Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
Permit No.: MSOP 131-7690
Plt ID: 131-00014
Reviewer: Paula M. Cognitore
Date: December 13, 1996

EU01A Cold Draw - #11 Annealing Furnace

Total Heat Input Capacity Potential Throughput
MMBtu/hr MMBtu/yr

9.54	83.6
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Emission Factor in lb/MMCF	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.0794	0.318	0.0251	4.18	0.230	3.51

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	0.0000877	0.0000501	0.00313	0.0752	0.000142

HAPs - Metals					
Emission Factor in lb/MMcf	Lead	Cadmium	Chromium	Manganese	Nickel
	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	0.0000209	0.0000460	0.0000585	0.0000159	0.0000877
Total Combined HAPs:					0.0789

EU01A Cold Draw - #1 Annealing Furnace

Total Heat Input Capacity Potential Throughput
MMBtu/hr MMBtu/yr

4.80	42.0
------	------

Emission Factor in lb/MMCF	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.0399	0.160	0.0126	2.10	0.116	1.77

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	0.0000442	0.0000252	0.00158	0.0378	0.0000715

HAPs - Metals					
Emission Factor in lb/MMcf	Lead	Cadmium	Chromium	Manganese	Nickel
	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	0.0000105	0.0000231	0.0000294	0.00000799	0.0000442
Total Combined HAPs:					0.0397

Methodology is the same as page 4.

Appendix A: Emissions Calculations

Page 4 of 14 TSD App A

Natural Gas Combustion Only

MM BTU/HR <100

Small Industrial Boilers, Annealing Furnaces, and Space Heaters

Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
Permit No.: MSOP 131-7690
Plt ID: 131-00014
Reviewer: Paula M. Cognitore
Date: December 13, 1996

EU01A Cold Draw - Boiler 1

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

7.00

61.3

Pollutant						
Emission Factor in lb/MMCF	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0	5.5	84.0
				**see below		
Potential Emission in tons/yr	0.0583	0.233	0.0184	3.07	0.169	2.58

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	0.0000644	0.0000368	0.00230	0.0552	0.000104

HAPs - Metals					
Emission Factor in lb/MMcf	Lead	Cadmium	Chromium	Manganese	Nickel
	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	0.0000153	0.0000337	0.0000429	0.0000117	0.0000644
Total Combined HAPs:					0.0579

EU01A Cold Draw - Boiler 2 (removed March 2000)

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

5.00

43.8

Pollutant						
Emission Factor in lb/MMCF	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0	5.5	84.0
				**see below		
Potential Emission in tons/yr	0.0416	0.166	0.0131	2.19	0.120	1.84

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	0.0000644	0.0000368	0.00230	0.0552	0.000104

HAPs - Metals					
Emission Factor in lb/MMcf	Lead	Cadmium	Chromium	Manganese	Nickel
	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	0.0000153	0.0000337	0.0000429	0.0000117	0.0000644
Total Combined HAPs:					0.0579

Methodology is the same as page 4.

Appendix A: Emissions Calculations

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Natural Gas Combustion Only

MM BTU/HR <100

Small Industrial Boilers, Annealing Furnaces, and Space Heaters

Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
Permit No.: MSOP 131-7690
Plt ID: 131-00014
Reviewer: Paula M. Cognitore
Date: December 13, 1996

EU01A Cold Draw - Two (2) Unit Heaters (Z and AA)

Total Heat Input Capacity Potential Throughput
MMBtu/hr MMcF/yr

2.50	21.9
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Pollutant						
Emission Factor in lb/MMCF	PM* 1.9	PM10* 7.6	SO2 0.6	NOx 100.0 **see below	VOC 5.5	CO 84.0
Potential Emission in tons/yr	0.0208	0.0832	0.00657	1.10	0.0602	0.920

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene 2.1E-03	Dichlorobenzene 1.2E-03	Formaldehyde 7.5E-02	Hexane 1.8E+00	Toluene 3.4E-03
Potential Emission in tons/yr	0.0000230	0.0000131	0.000821	0.0197	0.0000372

HAPs - Metals					
Emission Factor in lb/MMcf	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential Emission in tons/yr	0.00000548	0.0000120	0.0000153	0.00000416	0.0000230
Total Combined HAPs:					0.0207

EU01 A Cold Draw - Micro HN Process Boiler

Total Heat Input Capacity Potential Throughput
MMBtu/hr MMcF/yr

11.6	102
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Pollutant						
Emission Factor in lb/MMCF	PM* 1.9	PM10* 7.6	SO2 0.6	NOx 100.0 **see below	VOC 5.5	CO 84.0
Potential Emission in tons/yr	0.0965	0.386	0.0305	5.08	0.279	4.27

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene 2.1E-03	Dichlorobenzene 1.2E-03	Formaldehyde 7.5E-02	Hexane 1.8E+00	Toluene 3.4E-03
Potential Emission in tons/yr	0.000076	0.0000435	0.00272	0.0653	0.000123

HAPs - Metals					
Emission Factor in lb/MMcf	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential Emission in tons/yr	0.0000181	0.0000399	0.0000508	0.0000138	0.000076
Total Combined HAPs:					0.0684

Methodology is the same as page 4.

**Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100**

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Small Industrial Boilers, Annealing Furnaces, and Space Heaters

Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
Permit No.: MSOP 131-7690
Plt ID: 131-00014
Reviewer: Paula M. Cognitore
Date: December 13, 1996

EU01 A Cold Draw - Six (6) Flame Curtains

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

0.264

2.31

Pollutant						
Emission Factor in lb/MMCF	PM* 1.9	PM10* 7.6	SO2 0.6	NOx 100.0 **see below	VOC 5.5	CO 84.0
Potential Emission in tons/yr	0.00220	0.00879	0.000694	0.116	0.00636	0.0971

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene 2.1E-03	Dichlorobenzene 1.2E-03	Formaldehyde 7.5E-02	Hexane 1.8E+00	Toluene 3.4E-03
Potential Emission in tons/yr	0.0000762	0.0000435	0.00272	0.0653	0.000123

HAPs - Metals					
Emission Factor in lb/MMcf	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential Emission in tons/yr	0.0000181	0.0000399	0.0000508	0.0000138	0.000076

Total Combined HAPs: 0.0684

Methodology is the same as page 4.

Appendix A: Emissions Calculations

Page 7 of 14 TSD App A

Natural Gas Combustion Only

MM BTU/HR <100

Small Industrial Boilers, Annealing Furnaces, and Space Heaters

Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
Permit No.: MSOP 131-7690
Pit ID: 131-00014
Reviewer: Paula M. Cognitore
Date: December 13, 1996

EU01B Weld Mill

EU01B Weld Mill - West Annealing Furnace

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

17.1

150

Emission Factor in lb/MMCF	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.142	0.569	0.0449	7.49	0.412	6.29

EU01B Weld Mill - West Annealing Furnace

Emission Factor in lb/MMcf	HAPs - Organics				
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	0.000157	0.0000899	0.00562	0.135	0.000255

Emission Factor in lb/MMcf	HAPs - Metals				
	Lead	Cadmium	Chromium	Manganese	Nickel
	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	0.0000374	0.0000824	0.000105	0.0000285	0.000157
Total Combined HAPs:					0.141

Methodology:

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

PM emission factors are condensable and filterable.

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98)

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

The five highest organic and metal HAPs emission factors are provided above.

Additional HAPs emission factors are available in AP-42, Chapter 1.4.

Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100
Small Industrial Boilers, Annealing Furnaces, and Space Heaters

Page 8 of 14 TSD App A

Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
Permit No.: MSOP 131-7690
Pit ID: 131-00014
Reviewer: Paula M. Cognitore
Date: December 13, 1996

EU01B Weld Mill - East Annealing Furnace

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

5.70

49.9

Emission Factor in lb/MMCF	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0	5.5	84.0
Potential Emission in tons/yr	0.0474	0.190	0.0150	**see below	0.137	2.10

Emission Factor in lb/MMcf	HAPs - Organics				
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	0.0000524	0.0000300	0.00187	0.0449	0.0000849

Emission Factor in lb/MMcf	HAPs - Metals				
	Lead	Cadmium	Chromium	Manganese	Nickel
	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	0.0000125	0.0000275	0.0000350	0.00000949	0.0000524
Total Combined HAPs:					0.0471

EU01B Weld Mill - Four (4) Unit Heaters (T1 - T4)

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

1.60

14.0

Emission Factor in lb/MMCF	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0	5.5	84.0
Potential Emission in tons/yr	0.0133	0.0533	0.00420	**see below	0.0385	0.589

Emission Factor in lb/MMcf	HAPs - Organics				
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	0.0000147	0.00000841	0.000526	0.0126	0.0000238

Emission Factor in lb/MMcf	HAPs - Metals				
	Lead	Cadmium	Chromium	Manganese	Nickel
	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	0.00000350	0.00000771	0.00000981	0.00000266	0.0000147
Total Combined HAPs:					0.0132

Methodology is the same as page 12.

Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100
Small Industrial Boilers, Annealing Furnaces, and Space Heaters

Page 9 of 14 TSD App A

Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
Permit No.: MSOP 131-7690
Pit ID: 131-00014
Reviewer: Paula M. Cognitrore
Date: December 13, 1996

EU01B Weld Mill - One (1) Unit Heater (V)

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

1.88

16.4

Emission Factor in lb/MMCF	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.0156	0.0624	0.00493	0.821	0.0452	0.690

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene 2.1E-03	Dichlorobenzene 1.2E-03	Formaldehyde 7.5E-02	Hexane 1.8E+00	Toluene 3.4E-03
Potential Emission in tons/yr	0.0000172	0.00000986	0.000616	0.0148	0.0000279

HAPs - Metals					
Emission Factor in lb/MMcf	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential Emission in tons/yr	0.00000411	0.00000903	0.00001150	0.00000312	0.00001725
Total Combined HAPs:					0.0155

EU01B Weld Mill - Four (4) Flame Curtains

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

0.176

1.54

Emission Factor in lb/MMCF	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.00146	0.00586	0.000463	0.0771	0.00424	0.0648

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene 2.1E-03	Dichlorobenzene 1.2E-03	Formaldehyde 7.5E-02	Hexane 1.8E+00	Toluene 3.4E-03
Potential Emission in tons/yr	0.00000162	0.000000925	0.0000578	0.00139	0.00000262

HAPs - Metals					
Emission Factor in lb/MMcf	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential Emission in tons/yr	0.000000385	0.000000848	0.00000108	0.000000293	0.00000162
Total Combined HAPs:					0.00145

Methodology is the same as page 12.

Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100
Small Industrial Boilers, Annealing Furnaces, and Space Heaters

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Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
Permit No.: MSOP 131-7690
Plt ID: 131-00014
Reviewer: Paula M. Cognitore
Date: December 13, 1996

EU01C Hot Mill

EU01C Hot Mill - Billet Furnace (removed)

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

30.0

263

Pollutant						
Emission Factor in lb/MMCF	PM* 1.9	PM10* 7.6	SO2 0.6	NOx 100.0 **see below	VOC 5.5	CO 84.0
Potential Emission in tons/yr	0.250	0.999	0.0788	13.1	0.723	11.04

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene 2.1E-03	Dichlorobenzene 1.2E-03	Formaldehyde 7.5E-02	Hexane 1.8E+00	Toluene 3.4E-03
Potential Emission in tons/yr	0.000276	0.000158	0.00986	0.237	0.000447

HAPs - Metals					
Emission Factor in lb/MMcf	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential Emission in tons/yr	0.0000657	0.000145	0.000184	0.0000499	0.000276
Total Combined HAPs:					0.248

Methodology:

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

PM emission factors are condensable and filterable.

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98)

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

The five highest organic and metal HAPs emission factors are provided above.

Additional HAPs emission factors are available in AP-42, Chapter 1.4.

Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100
Small Industrial Boilers, Annealing Furnaces, and Space Heaters

Page 11 of 14 TSD App A

Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
Permit No.: MSOP 131-7690
Pit ID: 131-00014
Reviewer: Paula M. Cognitore
Date: December 13, 1996

EU01C Hot Mill - Annealing Furnace

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

44.8

392

Pollutant						
Emission Factor in lb/MMCF	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0	5.5	84.0
				**see below		
Potential Emission in tons/yr	0.373	1.49	0.118	19.6	1.08	16.5

EU01C Hot Mill - Annealing Furnace

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	0.000412	0.000235	0.0147	0.353	0.000667

HAPs - Metals					
Emission Factor in lb/MMcf	Lead	Cadmium	Chromium	Manganese	Nickel
	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	0.0000981	0.000216	0.000275	0.0000746	0.000412
Total Combined HAPs:					0.370

EU01C Hot Mill - Boiler 1 and Boiler 2

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

14.0

123

Pollutant						
Emission Factor in lb/MMCF	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0	5.5	84.0
				**see below		
Potential Emission in tons/yr	0.117	0.466	0.0368	6.13	0.337	5.15

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	0.000129	0.0000736	0.00460	0.110	0.000208

HAPs - Metals					
Emission Factor in lb/MMcf	Lead	Cadmium	Chromium	Manganese	Nickel
	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	0.0000307	0.0000675	0.0000858	0.0000233	0.000129
Total Combined HAPs:					0.116

Methodology is the same as page 17.

Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100
Small Industrial Boilers, Annealing Furnaces, and Space Heaters

Page 12 of 14 TSD App A

Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
Permit No.: MSOP 131-7690
Pit ID: 131-00014
Reviewer: Paula M. Cognitore
Date: December 13, 1996

EU01C Hot Mill - Twenty-three (23) Unit Heaters (P1-P12, R1-R6, S1, S2, T1, T2, U)

Total Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

6.95

60.9

	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF	1.9	7.6	0.6	100.0	5.5	84.0
				**see below		
Potential Emission in tons/yr	0.0578	0.231	0.0183	3.04	0.167	2.56

EU01C Hot Mill - Twenty-three (23) Unit Heaters (P1-P12, R1-R6, S1, S2, T1, T2, U)

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene 2.1E-03	Dichlorobenzene 1.2E-03	Formaldehyde 7.5E-02	Hexane 1.8E+00	Toluene 3.4E-03
Potential Emission in tons/yr	0.0000639	0.0000365	0.00228	0.0548	0.000103

HAPs - Metals					
Emission Factor in lb/MMcf	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential Emission in tons/yr	0.0000152	0.0000335	0.0000426	0.0000116	0.0000639

Total Combined HAPs: 0.0574

Methodology is the same as page 17.

Appendix A: Emission Calculations
Generator
Criteria Air Pollutants

Company Name: Plymouth Tube Company
Address City IN Zip: 504 North Keller Avenue, Winamac, Indiana 46996
MSOP No.: MSOP 131-7690
Plt ID: 131-00014
Reviewer: Paula M. Cognitore
Date: December 13, 1996

Emergency Generator at 500 hours per year of operation

Total Heat Input Capacity Potential Throughput
MMBtu/hr MMCF/yr

0.649

0.325

Pollutant						
	PM*	PM10*	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF	10.0	10.0	0.6	2840	116	399
Potential Emission in tons/yr	0.00162	0.00162	0.0000974	0.461	0.0188	0.0647

Methodology:

Emission factors obtained from FIRE 6.22, SCC# 2-01-002-02, natural gas-fired reciprocating internal combustion engines for electric generation

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

500 hours of operation per year

Appendix A: Emission Calculations**** unpaved roads ******Company Name: Plymouth Tube Company****Plant Location: 504 North Keller Avenue, Winamac, Indiana 46996****Permit: 131-7690****Plt ID: 131-00014****Date Received: December 13, 1996****Permit Reviewer: Paula M. Cognitore****** unpaved roads ****

The following calculations determine the amount of emissions created by vehicle traffic on unpaved roads, based on 8760 hours of use and AP-42, Ch 11.2.1.

$$\begin{aligned}
 &0.125 \text{ trip/hr} \times \\
 &0.25 \text{ mile/trip} \times \\
 &2 \text{ (round trip)} \times \\
 &8760 \text{ hr/yr} = 547.5 \text{ miles per year}
 \end{aligned}$$

$$\begin{aligned}
 E_f &= k \cdot 5.9 \cdot (s/12) \cdot (S/30) \cdot (W/3)^{0.7} \cdot (w/4)^{0.5} \cdot ((365-p)/365) \\
 &= 2.45 \text{ lb/mile}
 \end{aligned}$$

where k = 0.8 (particle size multiplier)

s = 4.8 % silt content of unpaved roads

p = 125 days of rain greater than or equal to 0.01 inches

S = 5 miles/hr vehicle speed

W = 35 tons average vehicle weight

w = 18 wheels

$$\frac{2.45 \text{ lb/mi} \times 547.5 \text{ mi/yr}}{2000 \text{ lb/ton}} = 0.671 \text{ tons/yr of Particulate Matter}$$

PM-10: 35% of PM = 0.235 tons/yr